



sequence.listing.ST25.txt
SEQUENCE LISTING

<110> McCray, Paul B.
Sanders, David A.
Jeffers, Scott A.
Davidson, Beverly L.
Sinn, Patrick L.

<120> PSEUDOTYPED VIRUSES AND METHODS FOR THEIR USE

<130> 290.00670120

<140> US 10/811,353

<141> 2004-03-26

<160> 16

<170> PatentIn version 3.2

<210> 1

<211> 681

<212> PRT

<213> Marburg virus glycoprotein

<400> 1

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1 5 10 15

Lys Asn Leu Pro Ile Leu Glu Ile Ala Ser Asn Asn Gln Pro Gln Asn
20 25 30

Val Asp Ser Val Cys Ser Gly Thr Leu Gln Lys Thr Glu Asp Val His
35 40 45

Leu Met Gly Phe Thr Leu Ser Gly Gln Lys Val Ala Asp Ser Pro Leu
50 55 60

Glu Ala Ser Lys Arg Trp Ala Phe Arg Thr Gly Val Pro Pro Lys Asn
65 70 75 80

Val Glu Tyr Thr Glu Gly Glu Ala Lys Thr Cys Tyr Asn Ile Ser
85 90 95

Val Thr Asp Pro Ser Gly Lys Ser Leu Leu Leu Asp Pro Pro Thr Asn
100 105 110

Ile Arg Asp Tyr Pro Lys Cys Lys Thr Ile His His Ile Gln Gly Gln
115 120 125

Asn Pro His Ala Gln Gly Ile Ala Leu His Leu Trp Gly Ala Phe Phe
130 135 140

Leu Tyr Asp Arg Ile Ala Ser Thr Thr Met Tyr Arg Gly Lys Val Phe
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145

150

155

160

Thr Glu Gly Asn Ile Ala Ala Met Ile Val Asn Lys Thr Val His Lys
165 170 175

Met Ile Phe Ser Arg Gln Gly Gln Gly Tyr Arg His Met Asn Leu Thr
180 185 190

Ser Thr Asn Lys Tyr Trp Thr Ser Ser Asn Gly Thr Gln Thr Asn Asp
195 200 205

Thr Gly Cys Phe Gly Ala Leu Gln Glu Tyr Asn Ser Thr Lys Asn Gln
210 215 220

Thr Cys Ala Pro Ser Lys Ile Pro Pro Pro Leu Pro Thr Ala Arg Pro
225 230 235 240

Glu Ile Lys Leu Thr Ser Thr Pro Thr Asp Ala Thr Lys Leu Asn Thr
245 250 255

Thr Asp Pro Ser Ser Asp Asp Glu Asp Leu Ala Thr Ser Gly Ser Gly
260 265 270

Ser Gly Glu Arg Glu Pro His Thr Thr Ser Asp Ala Val Thr Lys Gln
275 280 285

Gly Leu Ser Ser Thr Met Pro Pro Thr Pro Ser Pro Gln Pro Ser Thr
290 295 300

Pro Gln Gln Gly Gly Asn Asn Thr Asn His Ser Gln Asp Ala Val Thr
305 310 315 320

Glu Leu Asp Lys Asn Asn Thr Thr Ala Gln Pro Ser Met Pro Pro His
325 330 335

Asn Thr Thr Thr Ile Ser Thr Asn Asn Thr Ser Lys His Asn Phe Ser
340 345 350

Thr Leu Ser Ala Pro Leu Gln Asn Thr Thr Asn Asp Asn Thr Gln Ser
355 360 365

Thr Ile Thr Glu Asn Glu Gln Thr Ser Ala Pro Ser Ile Thr Thr Leu
370 375 380

Pro Pro Thr Gly Asn Pro Thr Thr Ala Lys Ser Thr Ser Ser Lys Lys
385 390 395 400

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Gly Pro Ala Thr Thr Ala Pro Asn Thr Thr Asn Glu His Phe Thr Ser
405 410 415

Pro Pro Pro Thr Pro Ser Ser Thr Ala Gln His Leu Val Tyr Phe Arg
420 425 430

Arg Lys Arg Ser Ile Leu Trp Arg Glu Gly Asp Met Phe Pro Phe Leu
435 440 445

Asp Gly Leu Ile Asn Ala Pro Ile Asp Phe Asp Pro Val Pro Asn Thr
450 455 460

Lys Thr Ile Phe Asp Glu Ser Ser Ser Gly Ala Ser Ala Glu Glu
465 470 475 480

Asp Gln His Ala Ser Pro Asn Ile Ser Leu Thr Leu Ser Tyr Phe Pro
485 490 495

Asn Ile Asn Glu Asn Thr Ala Tyr Ser Gly Glu Asn Glu Asn Asp Cys
500 505 510

Asp Ala Glu Leu Arg Ile Trp Ser Val Gln Glu Asp Asp Leu Ala Ala
515 520 525

Gly Leu Ser Trp Ile Pro Phe Phe Gly Pro Gly Ile Glu Gly Leu Tyr
530 535 540

Thr Ala Val Leu Ile Lys Asn Gln Asn Asn Leu Val Cys Arg Leu Arg
545 550 555 560

Arg Leu Ala Asn Gln Thr Ala Lys Ser Leu Glu Leu Leu Leu Arg Val
565 570 575

Thr Thr Glu Glu Arg Thr Phe Ser Leu Ile Asn Arg His Ala Ile Asp
580 585 590

Phe Leu Leu Thr Arg Trp Gly Gly Thr Cys Lys Val Leu Gly Pro Asp
595 600 605

Cys Cys Ile Gly Ile Glu Asp Leu Ser Lys Asn Ile Ser Glu Gln Ile
610 615 620

Asp Gln Ile Lys Lys Asp Glu Gln Lys Glu Gly Thr Gly Trp Gly Leu
625 630 635 640

Gly Gly Lys Trp Trp Thr Ser Asp Trp Gly Val Leu Thr Asn Leu Gly
645 650 655

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Ile Leu Leu Leu Leu Ser Ile Ala Val Leu Ile Ala Leu Ser Cys Ile
660 665 670

Cys Arg Ile Phe Thr Lys Tyr Ile Gly
675 680

<210> 2
<211> 2046
<212> DNA
<213> Marburg virus glycoprotein

<400> 2
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ctccagaaga cagaagatgt ccatctgatg ggattcacac tgagtggca aaaagttgct 180
gattccccctt tggaggcattc caagcgatgg gctttcagga caggtgtacc tcccaagaat 240
gtttagtata cagaagggga ggaagccaaa acatgctaca atataagtgt aacggatccc 300
tctggaaaat ctttgctgtt ggatccctt accaacatcc gtgactatcc taaatgcaaa 360
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aacaatggaa cacaaacgaa tgacactgga tgcttcggtg ctcttcaaga atacaactcc 660
acgaagaatc aaacatgtgc tccgtccaaa ataccctcac cactgcccac agcccgtcca 720
gagatcaaac ccacaaggcac cccaaactgat gccaccacac tcaacaccac agacccaaac 780
aatgtatgtg aggacctcat aacatccggt tcagggtccg gagaacagga accctataca 840
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caaccaagca cgccacagca agaaggaaac aacacagacc attcccaagg tactgtgact 960
gaacccaaca aaaccaacac aacggcacaa ccgtccatgc ccccccacaa caccactgca 1020
atctctacta acaacaccc tcagaacaac ttcagcaccc tctctgtatc actacaaaac 1080
accaccaatt acgacacaca gagcacagcc actgaaaatg aacaaaccag tgccccctcg 1140
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cccaacccga ccacacaaca tcttgtat ttcagaaaga aacgaagtat cctctggagg 1320
gaaggcgaca tgtttcttt tctggacggg ttaataaaatg ctccaattga ttttgatcca 1380
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aacactgc ct	actctggaga	aaatgagaac	gattgtgat g	cagagtta ag	aatttgagg c	1560
gttcaggagg	atgacctggc	agcagggctc	agttggatac	cgtttttg g	ccctggaaatc	1620
gaaggacttt	atactgctgg	tttaattaaa	aaccaaaaca	atttggtctg	caggttggagg	1680
cgtctagcca	atcaaactgc	caaattc ttg	gaactctt at	taagagtca c	aaccgaggaa	1740
aggacat ttt	ccttaattaa	tagacatg cc	attgactt tc	tactcacaag	gtggggagg a	1800
acatgca aag	tgcttggacc	tgattgttgc	attggaatag	aagactt gtc	caggaatatt	1860
tcggaacaaa	ttgaccaat	caaaaaagat	gaacaaaaag	aggggactgg	ttggggtcta	1920
ggtggtaa at	ggtggacatc	cgactggggt	gttcttacta	acttgggcat	tttgc tacta	1980
ttatccatag	ctgtctt gat	tgctctatcc	tgtattt gtc	gtatctt ac	caaata tata	2040
gggttaa						2046

<210> 3
<211> 676
<212> PRT
<213> Ebola virus glycoprotein

<400> 3

Met Gly Val Thr Gly Ile Leu Gln Leu Pro Arg Asp Arg Phe Lys Arg
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Thr Ser Phe Phe Leu Trp Val Ile Ile Leu Phe Gln Arg Thr Phe Ser
20 25 30

Ile Pro Leu Gly Val Ile His Asn Ser Thr Leu Gln Val Ser Asp Val
35 40 45

Asp Lys Leu Val Cys Arg Asp Lys Leu Ser Ser Thr Asn Gln Leu Arg
50 55 60

Ser Val Gly Leu Asn Leu Glu Gly Asn Gly Val Ala Thr Asp Val Pro
65 70 75 80

Ser Ala Thr Lys Arg Trp Gly Phe Arg Ser Gly Val Pro Pro Lys Val
85 90 95

Val Asn Tyr Glu Ala Gly Glu Trp Ala Glu Asn Cys Tyr Asn Leu Glu
100 105 110

Ile Lys Lys Pro Asp Gly Ser Glu Cys Leu Pro Ala Ala Pro Asp Gly
115 120 125

Ile Arg Gly Phe Pro Arg Cys Arg Tyr Val His Lys val Ser Gly Thr
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130 135 140
Gly Pro Cys Ala Gly Asp Phe Ala Phe His Lys Glu Gly Ala Phe Phe
145 150 155 160

Leu Tyr Asp Arg Leu Ala Ser Thr Val Ile Tyr Arg Gly Thr Thr Phe
165 170 175

Ala Glu Gly Val Val Ala Phe Leu Ile Leu Pro Gln Ala Lys Lys Asp
180 185 190

Phe Phe Ser Ser His Pro Leu Arg Glu Pro Val Asn Ala Thr Glu Asp
195 200 205

Pro Ser Ser Gly Tyr Tyr Ser Thr Thr Ile Arg Tyr Gln Ala Thr Gly
210 215 220

Phe Gly Thr Asn Glu Thr Glu Tyr Leu Phe Glu Val Asp Asn Leu Thr
225 230 235 240

Tyr Val Gln Leu Glu Ser Arg Phe Thr Pro Gln Phe Leu Leu Gln Leu
245 250 255

Asn Glu Thr Arg Tyr Thr Ser Gly Lys Arg Ser Asn Thr Thr Gly Lys
260 265 270

Leu Ile Trp Lys Val Asn Pro Glu Ile Asp Thr Thr Ile Gly Glu Trp
275 280 285

Ala Phe Trp Glu Thr Lys Lys Asn Leu Thr Arg Lys Ile Arg Ser Glu
290 295 300

Glu Leu Ser Phe Thr Ala Val Ser Asn Arg Ala Lys Asn Ile Ser Gly
305 310 315 320

Gln Ser Pro Ala Arg Thr Ser Ser Asp Pro Gly Thr Asn Thr Thr Thr
325 330 335

Glu Asp His Lys Ile Met Ala Ser Glu Asn Ser Ser Ala Met Val Gln
340 345 350

Val His Ser Gln Gly Arg Glu Ala Ala Val Ser His Leu Thr Thr Leu
355 360 365

Ala Thr Ile Ser Thr Ser Leu Arg Pro Pro Ile Thr Lys Pro Gly Pro
370 375 380

sequence.listing.ST25.txt

Asp Asn Ser Thr His Asn Thr Pro Val Tyr Lys Leu Asp Ile Ser Glu
385 390 395 400

Ala Thr Gln Val Glu Gln His His Arg Arg Thr Asp Asn Ala Ser Thr
405 410 415

Thr Ser Asp Thr Pro Pro Ala Thr Thr Ala Ala Gly Pro Leu Lys Ala
420 425 430

Glu Asn Thr Asn Thr Ser Lys Gly Thr Asp Leu Leu Asp Pro Ala Thr
435 440 445

Thr Thr Ser Pro Gln Asn His Ser Glu Thr Ala Gly Asn Asn Asn Thr
450 455 460

His His Gln Asp Thr Gly Glu Glu Ser Ala Ser Ser Gly Lys Leu Gly
465 470 475 480

Leu Ile Thr Asn Thr Ile Ala Gly Val Ala Gly Leu Ile Thr Gly Gly
485 490 495

Arg Arg Thr Arg Arg Glu Ala Ile Val Asn Ala Gln Pro Lys Cys Asn
500 505 510

Pro Asn Leu His Tyr Trp Thr Thr Gln Asp Glu Gly Ala Ala Ile Gly
515 520 525

Leu Ala Trp Ile Pro Tyr Phe Gly Pro Ala Ala Glu Gly Ile Tyr Ile
530 535 540

Glu Gly Leu Met His Asn Gln Asp Gly Leu Ile Cys Gly Leu Arg Gln
545 550 555 560

Leu Ala Asn Glu Thr Thr Gln Ala Leu Gln Leu Phe Leu Arg Ala Thr
565 570 575

Thr Glu Leu Arg Thr Phe Ser Ile Leu Asn Arg Lys Ala Ile Asp Phe
580 585 590

Leu Leu Gln Arg Trp Gly Gly Thr Cys His Ile Leu Gly Pro Asp Cys
595 600 605

Cys Ile Glu Pro His Asp Trp Thr Lys Asn Ile Thr Asp Lys Ile Asp
610 615 620

Gln Ile Ile His Asp Phe Val Asp Lys Thr Leu Pro Asp Gln Gly Asp
625 630 635 640

sequence.listing.ST25.txt

Asn Asp Asn Trp Trp Thr Gly Trp Arg Gln Trp Ile Pro Ala Gly Ile
645 650 655

Gly Val Thr Gly Val Ile Ile Ala Val Ile Ala Leu Phe Cys Ile Cys
660 665 670

Lys Phe Val Phe
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<210> 4
<211> 2030
<212> DNA
<213> Ebola virus glycoprotein

<400> 4
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agcacattac aggttagtga tgtcgacaaa ctggttgcc gtgacaaact gtcatccacg 180
aatcaattga gatcgttgg actgaatctc gaaggaaatg gagtggcaac tgacgtgcca 240
tctgcaacta aaagatgggg cttcaggtcc ggtgtccac caaaagtggt caattatgaa 300
gctggtaat gggctgaaaaa ctgctacaat cttgaaatca aaaaacctga cgggagtgag 360
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caggctaccg gcttggAAC caatgagaca gagtatttgt tcgaggttga caatttgacc 720
tacgtccaac ttgaatcaag attcacacca cagttctgc tccagctgaa tgagacaaga 780
tatacaagtg ggaaaaggag caataccacg ggaaaactaa tttggaaaggta caacccgaa 840
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aaccagggtcc ggacaacagc acccacaata caccgtgtaa taaacttgac atctctgagg 1200
caactcaagt tgaacaacat caccgcagaa cagacaacgc cagcacaacc tccgacactc 1260
cccccgccac gaccgcagcc ggacccctaa aagcagagaa caccaacacg agcaaggc 1320

sequence.listing.ST25.txt

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taattaccaa	tactattgt	ggagtcgcag	gactgatcac	aggcgggaga	agaactcgaa	1500
gagaagcaat	tgtcaatgt	caacccaaat	gcaaccctaa	tttacattac	tggactactc	1560
aggatgaagg	tgctgcaatc	ggactggcct	ggataccata	tttcgggcca	gcagccgagg	1620
gaatttacat	agaggggctg	atgcacaatc	aagatggttt	aatctgtggg	ttgagacagc	1680
tggccaacga	gacgactcaa	gctcttcaac	tattcctgag	agccacaacc	gagctacgca	1740
cctttcaat	cctcaaccgt	aaggcaattt	atttcttgc	gcagcgatgg	ggcggcacat	1800
gccacatttt	gggaccggac	tgctgtatcg	aaccacatga	ttggactaag	aacataacgg	1860
acaaaattga	ttagattt	catgattttg	ttgataaaac	ccttccggac	cagggggaca	1920
atgacaattt	gtggacagga	tggagacagt	ggataccggc	agttatttga	gttacaggcg	1980
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<210> 5
<211> 1254

<212> PRT

<213> Ross River Structural polyprotein

<400> 5

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1 5 10 15

Arg Pro Ala Phe Arg Pro Trp Gln Val Ser Met Gln Pro Thr Pro Thr
20 25 30

Met Val Thr Pro Met Leu Gln Ala Pro Asp Leu Gln Ala Gln Gln Met
35 40 45

Gln Gln Leu Ile Ser Ala Val Ser Ala Leu Thr Thr Lys Gln Asn Val
50 55 60

Lys Ala Pro Lys Gly Gln Arg Gln Lys Lys Gln Gln Lys Pro Lys Glu
65 70 75 80

Lys Lys Glu Asn Gln Lys Lys Pro Thr Gln Lys Lys Lys Gln Gln
85 90 95

Gln Lys Pro Lys Pro Gln Ala Lys Lys Lys Pro Gly Arg Arg Glu
100 105 110

Arg Met Cys Met Lys Ile Glu Asn Asp Cys Ile Phe Glu Val Lys Leu
115 120 125

sequence.listing.ST25.txt

Asp Gly Lys Val Thr Gly Tyr Ala Cys Leu Val Gly Asp Lys Val Met
130 135 140

Lys Pro Ala His Val Lys Gly Thr Ile Asp Asn Pro Asp Leu Ala Lys
145 150 155 160

Leu Thr Tyr Lys Lys Ser Ser Lys Tyr Asp Leu Glu Cys Ala Gln Ile
165 170 175

Pro Val His Met Lys Ser Asp Ala Ser Lys Tyr Thr His Glu Lys Pro
180 185 190

Glu Gly His Tyr Asn Trp His His Gly Ala Val Gln Tyr Ser Gly Gly
195 200 205

Arg Phe Thr Ile Pro Thr Gly Ala Gly Lys Pro Gly Asp Ser Gly Arg
210 215 220

Pro Ile Phe Asp Asn Lys Gly Arg Val Val Ala Ile Val Leu Gly Gly
225 230 235 240

Ala Asn Glu Gly Ala Arg Thr Ala Leu Ser Val Val Thr Trp Thr Lys
245 250 255

Asp Met Val Thr Arg Val Thr Pro Glu Gly Thr Glu Glu Trp Ser Ala
260 265 270

Ala Leu Met Met Cys Ile Leu Ala Asn Thr Ser Phe Pro Cys Ser Ser
275 280 285

Pro Pro Cys Tyr Pro Cys Cys Tyr Glu Lys Gln Pro Glu Gln Thr Leu
290 295 300

Arg Met Leu Glu Asp Asn Val Asn Arg Pro Gly Tyr Tyr Glu Leu Leu
305 310 315 320

Glu Ala Ser Met Thr Cys Arg Asn Arg Ser Arg His Arg Arg Ser Val
325 330 335

Thr Glu His Phe Asn Val Tyr Lys Ala Thr Arg Pro Tyr Leu Ala Tyr
340 345 350

Cys Ala Asp Cys Gly Asp Gly Tyr Phe Cys Tyr Ser Pro Val Ala Ile
355 360 365

Glu Lys Ile Arg Asp Glu Ala Pro Asp Gly Met Leu Lys Ile Gln Val
370 375 380

sequence.listing.ST25.txt

Ser Ala Gln Ile Gly Leu Asp Lys Ala Gly Thr His Ala His Thr Lys
385 390 395 400

Ile Arg Tyr Met Ala Gly His Asp Val Gln Glu Ser Lys Arg Asp Ser
405 410 415

Leu Arg Val Tyr Thr Ser Ala Ala Cys Ser Ile His Gly Thr Met Gly
420 425 430

His Phe Ile Val Ala His Cys Pro Pro Gly Asp Tyr Leu Lys Val Ser
435 440 445

Phe Glu Asp Ala Asp Ser His Val Lys Ala Cys Lys Val Gln Tyr Lys
450 455 460

His Asp Pro Leu Pro Val Gly Arg Glu Lys Phe Val Val Arg Pro His
465 470 475 480

Phe Gly Val Glu Leu Pro Cys Thr Ser Tyr Gln Leu Thr Thr Ala Pro
485 490 495

Thr Asp Glu Glu Ile Asp Met His Thr Pro Pro Asp Ile Pro Asp Arg
500 505 510

Thr Leu Leu Ser Gln Thr Ala Gly Asn Val Lys Ile Thr Ala Gly Gly
515 520 525

Arg Thr Ile Arg Tyr Asn Cys Thr Cys Gly Arg Asp Asn Val Gly Thr
530 535 540

Thr Ser Thr Asp Lys Thr Ile Asn Thr Cys Lys Ile Asp Gln Cys His
545 550 555 560

Ala Ala Val Thr Ser His Asp Lys Trp Gln Phe Thr Ser Pro Phe Val
565 570 575

Pro Arg Ala Asp Gln Thr Ala Arg Arg Gly Lys Val His Val Pro Phe
580 585 590

Pro Leu Thr Asn Val Thr Cys Arg Val Pro Leu Ala Arg Ala Pro Asp
595 600 605

Val Thr Tyr Gly Lys Lys Glu Val Thr Leu Arg Leu His Pro Asp His
610 615 620

Pro Thr Leu Phe Ser Tyr Arg Ser Leu Gly Ala Glu Pro His Pro Tyr

sequence.listing.ST25.txt

625	630	635	640												
Glu	Glu	Trp	Val	Asp	Lys	Phe	Ser	Glu	Arg	Ile	Ile	Pro	Val	Thr	Glu
		645						650							655
Glu	Gly	Ile	Glu	Tyr	Gln	Trp	Gly	Asn	Asn	Pro	Pro	Val	Arg	Leu	Trp
		660			665								670		
Ala	Gln	Leu	Thr	Thr	Glu	Gly	Lys	Pro	His	Gly	Trp	Pro	His	Glu	Ile
		675			680						685				
Ile	Gln	Tyr	Tyr	Tyr	Gly	Leu	Tyr	Pro	Ala	Ala	Thr	Ile	Ala	Ala	Val
		690			695						700				
Ser	Gly	Ala	Ser	Leu	Met	Ala	Leu	Leu	Thr	Leu	Ala	Ala	Thr	Cys	Cys
		705			710					715				720	
Met	Leu	Ala	Thr	Ala	Arg	Arg	Lys	Cys	Leu	Thr	Pro	Tyr	Ala	Leu	Thr
		725					730					735			
Pro	Gly	Ala	Val	Val	Pro	Leu	Thr	Leu	Gly	Leu	Leu	Cys	Cys	Ala	Pro
		740			745							750			
Arg	Ala	Asn	Ala	Ala	Ser	Phe	Ala	Glu	Thr	Met	Ala	Tyr	Leu	Trp	Asp
		755			760						765				
Glu	Asn	Lys	Thr	Leu	Phe	Trp	Met	Glu	Phe	Ala	Ala	Pro	Ala	Ala	Ala
		770			775						780				
Leu	Ala	Leu	Leu	Ala	Cys	Cys	Ile	Lys	Ser	Leu	Ile	Cys	Cys	Cys	Lys
		785			790					795					800
Pro	Phe	Ser	Phe	Leu	Val	Leu	Leu	Ser	Leu	Gly	Ala	Ser	Ala	Lys	Ala
		805				810						815			
Tyr	Glu	His	Thr	Ala	Thr	Ile	Pro	Asn	Val	Val	Gly	Phe	Pro	Tyr	Lys
		820			825							830			
Ala	His	Ile	Glu	Arg	Asn	Gly	Phe	Ser	Pro	Met	Thr	Leu	Gln	Leu	Glu
		835			840						845				
Val	Val	Glu	Thr	Ser	Trp	Glu	Pro	Thr	Leu	Asn	Leu	Glu	Tyr	Ile	Thr
		850			855						860				
Cys	Glu	Tyr	Lys	Thr	Val	Val	Pro	Ser	Pro	Phe	Ile	Lys	Cys	Cys	Gly
		865			870					875					880

sequence.listing.ST25.txt

Thr Ser Glu Cys Ser Ser Lys Glu Gln Pro Asp Tyr Gln Cys Lys Val
885 890 895

Tyr Thr Gly Val Tyr Pro Phe Met Trp Gly Gly Ala Tyr Cys Phe Cys
900 905 910

Asp Ser Glu Asn Thr Gln Leu Ser Glu Ala Tyr Val Asp Arg Ser Asp
915 920 925

Val Cys Lys His Asp His Ala Ser Ala Tyr Lys Ala His Thr Ala Ser
930 935 940

Leu Lys Ala Thr Ile Arg Ile Ser Tyr Gly Thr Ile Asn Gln Thr Thr
945 950 955 960

Glu Ala Phe Val Asn Gly Glu His Ala Val Asn Val Gly Gly Ser Lys
965 970 975

Phe Ile Phe Gly Pro Ile Ser Thr Ala Trp Ser Pro Phe Asp Asn Lys
980 985 990

Ile Val Val Tyr Lys Asp Asp Val Tyr Asn Gln Asp Phe Pro Pro Tyr
995 1000 1005

Gly Ser Gly Gln Pro Gly Arg Phe Gly Asp Ile Gln Ser Arg Thr
1010 1015 1020

Val Glu Ser Lys Asp Leu Tyr Ala Asn Thr Ala Leu Lys Leu Ser
1025 1030 1035

Arg Pro Ser Pro Gly Val Val His Val Pro Tyr Thr Pro Thr Pro
1040 1045 1050

Ser Gly Phe Lys Tyr Trp Leu Lys Glu Lys Gly Ser Ser Leu Asn
1055 1060 1065

Thr Lys Ala Pro Phe Gly Cys Lys Ile Lys Thr Asn Pro Val Arg
1070 1075 1080

Ala Met Asp Cys Ala Val Gly Ser Ile Pro Val Ser Met Asp Ile
1085 1090 1095

Pro Asp Ser Ala Phe Thr Arg Val Val Asp Ala Pro Ala Val Thr
1100 1105 1110

Asp Leu Ser Cys Gln Val Val Val Cys Thr His Ser Ser Asp Phe
1115 1120 1125

sequence.listing.ST25.txt

Gly Gly Val Ala Thr Leu Ser Tyr Lys Thr Asp Lys Pro Gly Lys
1130 1135 1140

Cys Ala Val His Ser His Ser Asn Val Ala Thr Leu Gln Glu Ala
1145 1150 1155

Thr Val Asp Val Lys Glu Asp Gly Lys Val Thr Val His Phe Ser
1160 1165 1170

Thr Ala Ser Ala Ser Pro Ala Phe Lys Val Ser Val Cys Asp Ala
1175 1180 1185

Lys Thr Thr Cys Thr Ala Ala Cys Glu Pro Pro Lys Asp His Ile
1190 1195 1200

Val Pro Tyr Gly Ala Ser His Asn Asn Gln Val Phe Pro Asp Met
1205 1210 1215

Ser Gly Thr Ala Met Thr Trp Val Gln Arg Leu Ala Ser Gly Leu
1220 1225 1230

Gly Gly Leu Ala Leu Ile Ala Val Val Val Leu Val Leu Val Thr
1235 1240 1245

Cys Ile Thr Met Arg Arg
1250

<210> 6
<211> 437
<212> PRT
<213> Ross River Virus E1

<400> 6

Glu His Thr Ala Thr Ile Pro Asn Val Val Gly Phe Pro Tyr Lys Ala
1 5 10 15

His Ile Glu Arg Asn Gly Phe Ser Pro Met Thr Leu Gln Leu Glu Val
20 25 30

Val Glu Thr Ser Leu Glu Pro Thr Leu Asn Leu Glu Tyr Ile Thr Cys
35 40 45

Glu Tyr Lys Thr Val Val Pro Ser Pro Phe Ile Lys Cys Cys Gly Thr
50 55 60

Ser Glu Cys Ser Ser Lys Glu Gln Pro Asp Tyr Gln Cys Lys Val Tyr
65 70 75 80

sequence.listing.ST25.txt

Thr Gly Val Tyr Pro Phe Met Trp Gly Gly Ala Tyr Cys Phe Cys Asp
85 90 95

Ser Glu Asn Thr Gln Leu Ser Glu Ala Tyr Val Asp Arg Ser Asp Val
100 105 110

Cys Lys His Asp His Ala Ser Ala Tyr Lys Ala His Thr Ala Ser Leu
115 120 125

Lys Ala Thr Ile Arg Ile Ser Tyr Gly Thr Ile Asn Gln Thr Thr Glu
130 135 140

Ala Phe Val Asn Gly Glu His Ala Val Asn Val Gly Gly Ser Lys Phe
145 150 155 160

Ile Phe Gly Pro Ile Ser Thr Ala Trp Ser Pro Phe Asp Asn Lys Ile
165 170 175

Val Val Tyr Lys Asp Asp Val Tyr Asn Gln Asp Phe Pro Pro Tyr Gly
180 185 190

Ser Gly Gln Pro Gly Arg Phe Gly Asp Ile Gln Ser Arg Thr Val Glu
195 200 205

Ser Lys Asp Leu Tyr Ala Asn Thr Ala Leu Lys Leu Ser Arg Pro Ser
210 215 220

Pro Gly Val Val His Val Pro Tyr Thr Gln Thr Pro Ser Gly Phe Lys
225 230 235 240

Tyr Trp Leu Lys Glu Lys Gly Ser Ser Leu Asn Thr Lys Ala Pro Phe
245 250 255

Gly Cys Lys Ile Lys Thr Asn Pro Val Arg Ala Met Asp Cys Ala Val
260 265 270

Gly Ser Ile Pro Val Ser Met Asp Ile Pro Asp Ser Ala Phe Thr Arg
275 280 285

Val Val Asp Ala Pro Ala Val Thr Asp Leu Ser Cys Gln Val Val Val
290 295 300

Cys Thr His Ser Ser Asp Phe Gly Gly Val Ala Thr Leu Ser Tyr Lys
305 310 315 320

Thr Asp Lys Pro Gly Lys Cys Ala Val His Ser His Ser Asn Val Ala
325 330 335

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Thr Leu Gln Glu Ala Thr Val Asp Val Lys Glu Asp Gly Lys Val Thr
340 345 350

Val His Phe Ser Thr Ala Ser Ala Ser Pro Ala Phe Lys Val Ser Val
355 360 365

Cys Asp Ala Lys Thr Thr Cys Thr Ala Ala Cys Glu Pro Pro Lys Asp
370 375 380

His Ile Val Pro Tyr Gly Ala Ser His Asn Asn Gln Val Phe Pro Asp
385 390 395 400

Met Ser Gly Thr Ala Met Thr Trp Val Gln Arg Leu Ala Ser Gly Leu
405 410 415

Gly Gly Leu Ala Leu Ile Ala Val Val Val Leu Val Leu Val Thr Cys
420 425 430

Ile Thr Met Arg Arg
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<211> 1311
<212> DNA
<213> Ross River Virus E1

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cttaacctgg agtacattac ctgcgaatac aagacgggtgg tcccttcgcc attcatcaaa 120
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acgggtgtat acccattcat gtggggtgga gcctactgtt tctgcgactc cgagaacacg 180
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Page 16 540
600
660
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780
840

sequence.listing.ST25.txt

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<210> 8

<211> 487

<212> PRT

<213> Ross River Virus E3-E2

<400> 8

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Cys Ser Ser Pro Pro Cys Tyr Pro Cys Cys Tyr Glu Lys Gln Pro Glu
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Gln Thr Leu Arg Met Leu Glu Asp Asn Val Asn Arg Pro Gly Tyr Tyr
35 40 45

Glu Leu Leu Glu Ala Ser Met Thr Cys Arg Asn Arg Ser Arg His Arg
50 55 60

Arg Ser Val Thr Glu His Phe Asn Val Tyr Lys Ala Thr Arg Pro Tyr
65 70 75 80

Leu Ala Tyr Cys Ala Asp Cys Gly Asp Gly Tyr Phe Cys Tyr Ser Pro
85 90 95

Val Ala Ile Glu Lys Ile Arg Asp Glu Ala Ser Asp Gly Met Leu Lys
100 105 110

Ile Gln Val Ser Ala Gln Ile Gly Leu Asp Lys Ala Gly Thr His Ala
115 120 125

His Thr Lys Ile Arg Tyr Met Ala Gly His Asp Val Gln Glu Ser Lys
130 135 140

Arg Asp Ser Leu Arg Val Tyr Thr Ser Ala Ala Cys Ser Ile His Gly
145 150 155 160

sequence.listing.ST25.txt

Thr Met Gly His Phe Ile Val Ala His Cys Pro Pro Gly Asp Tyr Leu
165 170 175

Lys Val Ser Phe Glu Asp Ala Asp Ser His Val Lys Ala Cys Lys Val
180 185 190

Gln Tyr Lys His Asp Pro Leu Pro Val Gly Arg Glu Lys Phe Val Val
195 200 205

Arg Pro His Phe Gly Val Glu Leu Pro Cys Thr Ser Tyr Gln Leu Thr
210 215 220

Thr Ala Pro Thr Asp Glu Glu Ile Asp Met His Thr Pro Pro Asp Ile
225 230 235 240

Pro Asp Arg Thr Leu Leu Ser Gln Thr Ala Gly Asn Val Lys Ile Thr
245 250 255

Ala Gly Gly Arg Thr Ile Arg Tyr Asn Cys Thr Cys Gly Arg Asp Asn
260 265 270

Val Gly Thr Thr Ser Thr Asp Lys Thr Ile Asn Thr Cys Lys Ile Asp
275 280 285

Gln Cys His Ala Ala Val Thr Ser His Asp Lys Trp Gln Phe Thr Ser
290 295 300

Pro Phe Val Pro Arg Ala Asp Gln Thr Ala Arg Arg Gly Lys Val His
305 310 315 320

Val Pro Phe Pro Leu Thr Asn Val Thr Cys Arg Val Pro Leu Ala Arg
325 330 335

Ala Pro Asp Val Thr Tyr Gly Lys Lys Glu Val Thr Leu Arg Leu His
340 345 350

Pro Asp His Pro Thr Leu Phe Ser Tyr Arg Ser Leu Gly Ala Glu Pro
355 360 365

His Pro Tyr Glu Glu Trp Val Asp Lys Phe Ser Glu Arg Ile Ile Pro
370 375 380 385

Val Thr Glu Glu Gly Ile Glu Tyr Gln Trp Gly Asn Asn Pro Pro Val
385 390 395 400

Arg Leu Trp Ala Gln Leu Thr Thr Glu Gly Lys Pro His Gly Trp Pro

sequence.listing.ST25.txt

405

410

415

His Glu Ile Ile Gln Tyr Tyr Tyr Gly Leu Tyr Pro Ala Ala Thr Ile
 420 425 430

Ala Ala Val Ser Gly Ala Ser Leu Met Ala Leu Leu Thr Leu Ala Ala
 435 440 445

Thr Cys Cys Met Leu Ala Thr Ala Arg Arg Lys Cys Leu Thr Pro Tyr
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Ala Leu Thr Pro Gly Ala Val Val Pro Leu Thr Leu Gly Leu Leu Cys
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Cys Ala Pro Arg Ala Asn Ala
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<210> 9
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 <212> DNA
 <213> Ross River Virus E3-E2

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<212> PRT
<213> Marburg glycoprotein C-terminus mutation

<400> 10

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<210> 11
<211> 16
<212> PRT
<213> Marburg glycoprotein C-terminus mutation

<400> 11

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<210> 12
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sequence.listing.ST25.txt

<212> PRT
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<400> 14

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<212> PRT
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<210> 16

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<212> PRT
<213> Marburg glycoprotein C-terminus mutation

<400> 16

Leu Ile Ala Leu Ser Cys Ile Cys Arg Lys
1 5 10